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A NEW SPECIES OF SPINED LOACH (OSTEICHTHYES, COBITIDAE) FROM THE PEARL RIVER, GUANGXI OF CHINA

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Abstract A new species of spined loach, *Cobitis australis* sp. nov. is described from the Yujiang River and the Yongjiang River, a tributaries of the Pearl River basin, Guangxi, North China. Based on the sequences of mitochondrial cytochrome *b* gene, the interspecies relationships of *Cobitis* and *Iksookimia* were examined. The molecular study supported the species status of *C. australis* sp. nov. *Cobitis australis* is distinguished from its congeners by following combination: absence of the Gambetta's pigmentation pattern; presence of sexual dimorph colour pattern with 17 - 20 irregular blotches on the dorsum in males and 13 oval blotches on the dorsum and the blotches extending trangle-shape on the dorsolateral sides in females; 11 - 13 irregular vertical elongated "v" -shape blotches along midlateral lines, and between them more then 20 vertical bars in males and less than 20 in females; 4 - 5 striations on the dorsal and caudal fins; one slender and long finger-shaped *lamina circularis* at the base of second ray of the male pectoral fins, the second ray is elongated nearly filamentous; scales vertical elongated and oval, with a large focal area; mental lobes of lower lip pointed not ending in a filiform tip; barbels short, barbel length equal to or shorter than eye diameter.

Key words Cypriniformes, Cobitidae, *Cobitis*, new species, Guangxi.

1 Introduction

The genus *Cobitis* Linnaeus, 1758 is one of the largest groups of the family Cobitidae and highly diversification in Asia, which also implies its evolutionary origin there (Chen, 1981; Chen and Zhu, 1984; Bănărescu, 1990). The Pearl River (Zhujiang) is the biggest river in Southern China. At present, three species of *Cobitis* has found in Southern China, namely *C. arenae* Lin, 1934; *C. multimaculata* Chen *et* Chen, 2011 and *C. microcephala* Chen *et* Chen, 2011. Here we report a new species, *Cobitis australis*, based on two specimens collected from the Yujiang and the Yongjiang, the tributaries of the Pearl River in Guangxi.

2 Material and Methods

2.1 Morphology

Fish was collected by hand nets. The specimens were preserved in 95 % ethanol. Measurements were made in the laboratory using digital calipers to the nearest 0.1 mm. Fin-rays (simple and branched) were counted under transmitted light using a binocular dissecting microscope. Simple rays of the dorsal, ventral and anal fins were counted anteriorposteriorly and dorsoventrally for the caudal and pectoral fins. Scales from the subdorsal region between the dorsal fin and lateral line were observed in Leica GZ6 stereomicroscope and photographed by Leica DC180 camera. Specimens are preserved in the Institute of Hydrobiology (IHB), the Chinese Academy of Sciences.

2.2 DNA extraction, amplification and sequencing

We sequenced the complete mitochondrial cytochrome *b* gene of 1 140 bp for 12 individuals belonging to seven species of the genus *Cobitis*. Total genomic DNA was isolated by the standard phenol-chloroform method (Sambrook *et al.*, 1989). The complete mitochondrial cytochrome *b* (cyt b) was amplified and sequenced using the primer L14724 (5′-GAC TTG AAA AAC CAC CGT TG-3′) and H15915 (5′-CTC CGA TCT CCG GAT TAC AAG AC-3′) (Xiao *et al.*, 2001). The PCR was performed at an initial denaturation step at 95 ℃ for 4 min, followed by 35 cycles at 94 ℃ for 40 s, 52 ℃ - 60 ℃ for 45 s, 72 ℃ for 1 min, and a final extension at 72 ℃ for 8 min. The amplified fragments were purified with BioStar glass-milk DNA purification kit following the manufactures instruction. The purified fragments were sequenced by Shanghai DNA Biotechnologies Company. The information of specimens is given in Table 1.

2.3 Analysis of DNA sequences

The sequences were aligned using Clustal X 1.81

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Table 1. Taxa analysed in this study, their sites of origin and their GenBank Accession numbers.

Scientific name in source	Locality	Accession Nos.
Cobitis sinensis 1	China, Guizhou, Yuangjiang	JX888902
Cobitis sinensis 2	China, Guizhou, Yuangjiang	
Cobitis macrostigma	China, Jiangxi, L. Poyang	JX888904
Cobitis dolichorhynchus 1	China, Fujiang, Jiulongjiang	JX888908
Cobitis dolichorhynchus 2	China, Fujiang, Jiulongjiang	
Cobitis lutheri 1	China, Heilongjiang, Heilongjiang	JX888906
Cobitis lutheri 2	China, Heilongjiang, Heilongjiang	
Cobitis microcephala 1	China, Guangxi, Nanliujiang	JX888907
Cobitis microcephala 2	China, Guangxi, Nanliujiang	
Cobitis australis sp. nov. 1	China, Guangxi, Yongjiang	KC753352
Cobitis australis sp. nov. 2	China, Guangxi, Yujiang	KC753353
Cobitis arenae	China, Hainan, Nandujiang	JX888905
Cobitis melanoleuca	Šlechtová *et al.* (2008)	EF508500*
Cobitis pacifica 1	Šlechtová *et al.* (2008)	EF508505*
Cobitis pacifica 2	Šlechtová *et al.* (2008)	EF508506*
Cobitis rara	Šlechtová *et al.* (2008)	EF508507*
Cobitis granoei	Tang *et al.* (2005)	DQ105242*
Iksookimia koreensis	Šlechtová *et al.* (2008)	EF508511*
Cobitis choii	Šlechtová *et al.* (2008)	EF508510*
Iksookimia longicorpa 1	Šlechtová *et al.* (2008)	EF508513*
Iksookimia longicorpa 2	Šlechtová *et al.* (2008)	EF508514*
Iksookimia pumila	Šlechtová *et al.* (2008)	EF508515*
Iksookimia yongdokensis	Šlechtová *et al.* (2008)	EF508516*
Sabanejewia balcanica	Perdices and Doadria (2001)	AF499190*

Sequences marked with * were retrieved from GenBank.

(Thompson *et al.*, 1997). The phylogenetic trees were constructed using Bayesian inference (BI) as implemented in MrBayes 3.0 (Huelsenbeck and Ronquist 2001) and Maximum likelihood (ML) as performed in MEGA 5.05 (Tamura *et al.*, 2011). For the ML analyses, substitution model were calculated applying Kimura's two parameter using rates. Nonparametric bootstrap support for internal branches was calculated for ML with 1 000 pseudoreplicates. For the BI analyses, four Metropolis coupled Markov Chains Monte Carlo (MCMCMC) were run for 2 × 106 generations starting with random trees under the GTR + G + I and sampling frequency of each 100 generations. The datasets were partitioned into codon positions and the parameter values were estimated during the analyses for each partition independently. Log-likelihood stability was reached after *c.* 60 000 generations, and then we excluded the first 600 trees and used the remaining trees to compute a 50 % majority-rule consensus tree. Based on the recent study on the family of Cobitidae (Šlechtová *et al.*, 2008), *Sabanejewia* Vladykov, 1929 was chosen as outgroup taxa.

3 Results

3.1 Molecular analysis

The entire cytochrome *b* (1 140 bp) gene sequences using MEGA 5.05 with Kimura's two parameter model (K2p) showed intraspecies genetic divergence (< 0.8 %) and interspecies genetic divergence ranged between 1.0 % [*C. choii* (Kim *et* Son, 1984) versus *C. granoei* Rendal, 1935] and 21.2 % (*C. arenae* versus *C. macrostigma* Dabry, 1872) (Table 2).

Topologies of the trees recovered by two phylogenetic methods were shown in Fig. 1 (BI) and 2 (ML), respectively. *C. australis* 1 collected from the Yongjiang River and *C. australis* 2 collected from the Yujiang River, clusters together with strong high Bayesian values (100 %) and bootstrap (100 %), and then clusters with *C. granoei*, *C. choii* and *C. melanoleuca* Nichols, 1925 with strong high Bayesian values (100 %) hand bootstrap (93 %) (clade C in Figs 1–2).

Table 2. Pair-wise net genetic distance with the Kimura-2 parameter model within species of *Cobitis* and *Iksookimia* based on the cyt *b* gene.

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	*C. sinensis* 2																	
2	*C. macrostigma*	0. 141																
3	*C. arenae*	0. 181	0. 212															
4	*C. lutheri* 1	0. 131	0. 129	0. 187														
5	*C. lutheri* 2	0. 132	0. 130	0. 188	0. 003													
6	*C. granoei*	0. 178	0. 181	0. 190	0. 176	0. 177												
7	*C. choii*	0. 174	0. 182	0. 189	0. 178	0. 180	0. 010											
8	*I. koreensis*	0. 119	0. 139	0. 172	0. 140	0. 144	0. 149	0. 147										
9	*I. longicorpa* 1	0. 105	0. 110	0. 191	0. 102	0. 103	0. 156	0. 156	0. 112									
10	*I. yongdokensis*	0. 110	0. 114	0. 186	0. 092	0. 096	0. 163	0. 163	0. 111	0. 040								
11	*I. pumila*	0. 121	0. 136	0. 164	0. 134	0. 138	0. 145	0. 143	0. 020	0. 114	0. 114							
12	*C. pacifica* 1	0. 115	0. 127	0. 167	0. 133	0. 136	0. 155	0. 157	0. 093	0. 113	0. 112	0. 089						
13	*C. rara*	0. 146	0. 131	0. 183	0. 126	0. 123	0. 165	0. 168	0. 126	0. 112	0. 116	0. 123	0. 114					
14	*C. melanoleuca*	0. 162	0. 165	0. 174	0. 176	0. 175	0. 132	0. 125	0. 168	0. 166	0. 169	0. 160	0. 163	0. 168				
15	*C. microcephala* 2	0. 125	0. 121	0. 171	0. 122	0. 123	0. 173	0. 173	0. 130	0. 100	0. 097	0. 123	0. 115	0. 114	0. 171			
16	*C. dolichorhynchus* 1	0. 142	0. 138	0. 185	0. 127	0. 130	0. 171	0. 174	0. 134	0. 111	0. 111	0. 131	0. 131	0. 112	0. 166	0. 120		
17	*C. australis* sp. nov. 1	0. 158	0. 173	0. 176	0. 167	0. 155	0. 161	0. 159	0. 143	0. 158	0. 158	0. 135	0. 161	0. 158	0. 145	0. 161	0. 170	
18	*C. australis* sp. nov. 2	0. 161	0. 174	0. 179	0. 170	0. 158	0. 157	0. 155	0. 143	0. 164	0. 165	0. 135	0. 161	0. 159	0. 145	0. 162	0. 174	0. 008

Table 3. Comparison of *Cobitis australis* sp. nov. with 7 related cobitid species.

Characters	*Cobitis australis*	*Iksookimia koreensis*	*Iksookimia pumila*	*Iksookimia yongdokensis*	*Iksookimia hugowolfeldi*	*Iksookimia longicorpus*	*Cobitis multimaculata*	*Cobitis arenae*
The lateral vertical bars continuous or not along dorsal bands	Discontinuous	Discontinuous	Continuous	Discontinuous	Discontinuous	Continuous	Discontinuous	Discontinuous
The blotches on the dorsum	17 – 20 irregular in males, 13 in females	11 – 13 short rectangular blotches	9 – 11 long rectangle blotches	7 – 9 short rectangle blotches	11 – 13 short rectangle blotches	12 – 15 long rectangle blotches	16 – 18 short rectangle blotches	21 – 14 spots
The vertical bars along midlateral line	11 – 13 wide and short vertical bars	13 – 14 thin and long vertical bars	9 – 10 wide and long vertical bars	9 – 13 wide and long vertical bars	9 – 11 very thin and long vertical bars	10 – 12 wide and long vertical bars	17 – 22 oval blotches	20 – 25 spots
The blotches on the dorsolateral sides	More then 20 large vertical large bars in males and less than 20 in females	More then 20 small irregular speckles	Less than 10 large vertical bars	More then 20 dense irregular speckles	More then 20 dense irregular speckles	Less than 20 vertical large bars	More then 20 small vertically elongated oval blotches	More then 20 small dots
The number bars in the caudal fin	4 – 5 bars	3 – 4 bars	2 – 3 bars	3 – 4 bars	3 – 4 bars	3 – 4 bars	4 – 5 bars	3 – 4 bars
The shape of *lamina circularis*	Slender and long	Slender and long	Slender and long	Plate	Plate	Plate	Plate	Plate
The structure of scales	Vertical elongated scales with a slight large focal area	Round or oval scales with a large focal area		Vertical elongated scales with a large focal area	Round or oval scales with a mall focal area	Round or oval scales with a small focal area	Round or oval scales with a small focal area	Transversal elongated scales with a large focal area
Data source	Original	Nalbant, 1993; Kim and Son, 1983	Kim and Park, 1997	Kim and Park, 1997	Nalbant, 1993; Kim and Park, 1997	Nalbant, 1993; Kim and Park, 1997	Chen and Chen, 2011	Chen and Chen, 2011

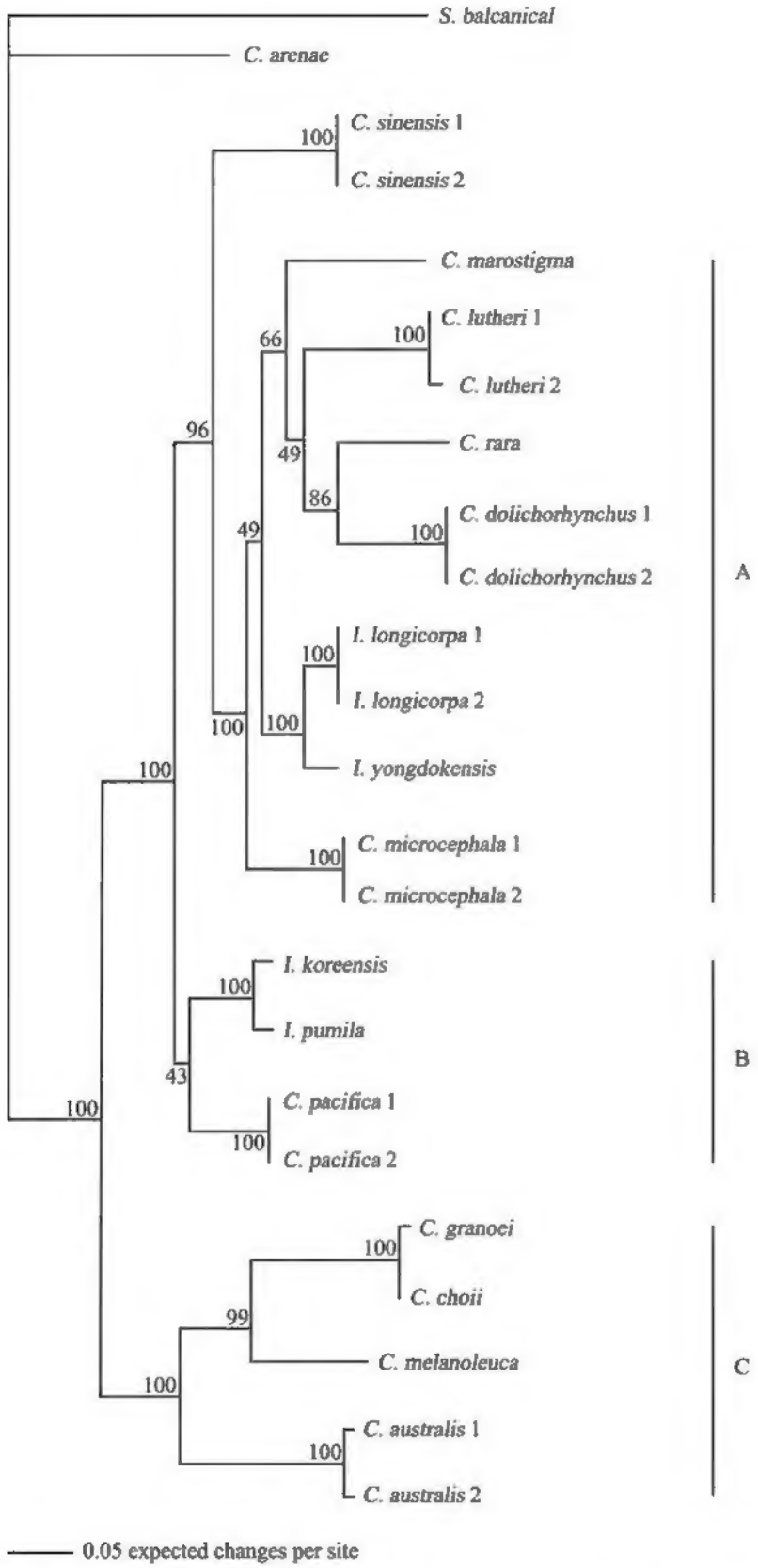


Fig. 1. Bayesian phylogeny of 18 mitochondrial cytochrome *b* lineages of *Cobitis* spp., five lineages of *Iksookimia* spp. and one lineage *Sabanejewia balcanica* used as out-groups. The lineages are numbered as in Table 1. Upper values at the branches correspond to Bayesian posterior probabilities.

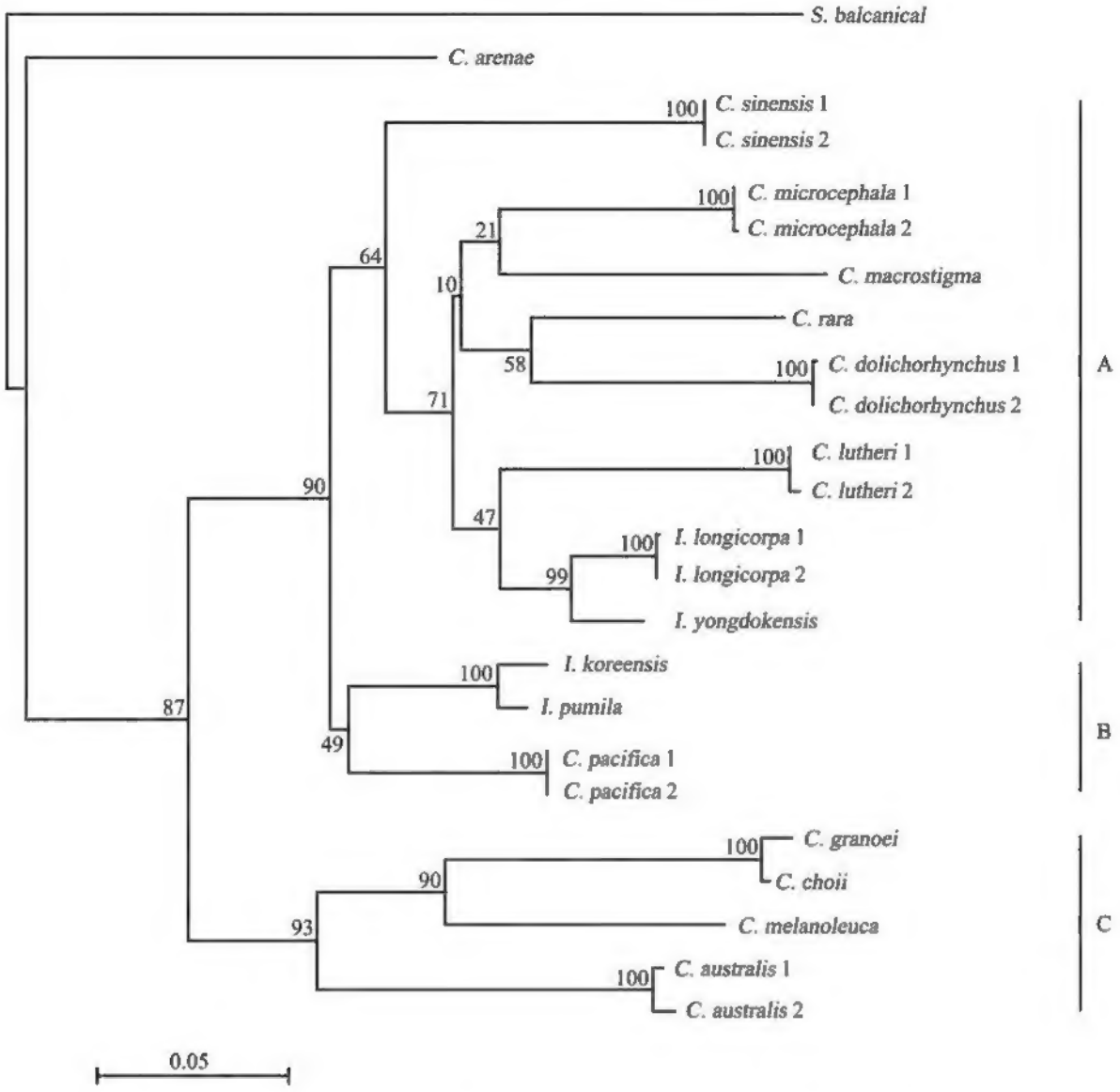


Fig. 2. Maximum likelihood tree based on Kimura 2-parameter model calculated in MEGA 5.05 based on entire cytochrome *b* sequences. Bootstrap percentages are shown on branches.

Both the phylogenetic position of *C. australis* in the tress (BI and ML) and the genetic distances between interspecies of *Cobitis* (Table 2) supported that *C. australis* is a new species.

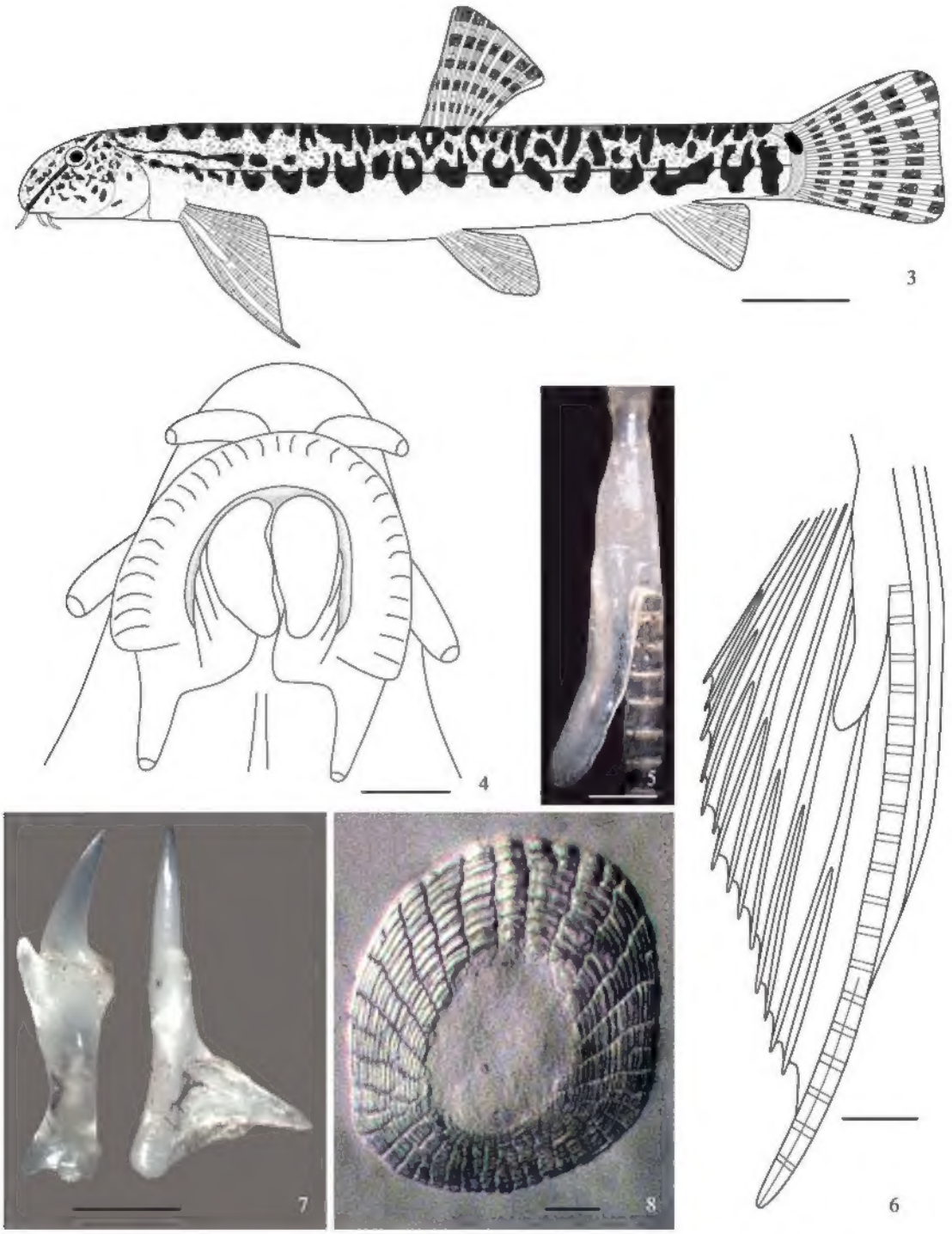
3.2 Taxonomy

***Cobitis australis* sp. nov.** (Figs 3 – 10)

Holotype IHB 0605157, male, 94.1 mm total length (TL), 80.8 mm standard length (SL), Yongjiang, a tributary of Pearl River in Nanning City in Guangxi, Southern China (22°79′N, 108°33′E), 1 May 2006, collected from the Nanning farm product market by CHEN Yong-Xia and ZHU Xiu-Fang.

Paratypes IHB 0605158, female, 98.1 mm TL, 83.1 mm SL, Yujiang, a tributary of Pearl River in Guiping City in Guangxi, China (22° 78′ N, 108°36′E), 5 May 2006, collected from the Guiping farm product market by CHEN Yong-Xia and ZHU Xiu-Fang.

Diagnosis. *Cobitis australis* sp. nov. is distinguishable from its congeners by the following combination of characters: absence of the Gambetta's pigmentation pattern, presence of sexual dimorph colour pattern with 17 – 20 irregular blotches on the dorsum in male and 13 oval blotches on the dorsum and the blotches extending trangle-shape on the dorsolateral sides in females; 11 – 13 irregular vertical elongated "v" -shape blotches along midlateral lines, and between them more then 20 vertical bars in males and less than 20 in females; 4 – 5 striations on the dorsal and caudal fins (Figs 3, 9 – 10); one slender and long finger-shaped *lamina circularis* at the base of second ray of the male pectoral fins (Figs 5 – 6), the second ray is elongated nearly filamentous (Figs 6,



Figs 3 – 8. *Cobitis australis* sp. nov. 3. Holotype. 4. Mouth character. 5 – 6. Lamina circularis in the pectoral fin of male. 7. Suborbital spine. 8. Subdorsal scales. Scale bars: 3 = 1 cm, 4 – 8 = 1 mm.

9); scales large, vertical elongated and oval, with a large focal area, 26 – 30 radial grooves (Fig. 8); mental lobes undeveloped, two lower lip pointed not ending in a filiform tip (Fig. 4); barbels short, barbel length equal to or shorter than eye diameter. Suborbital spine of the *processus latero-caudalis* less than one-third of the *processus medio-caudalis* length (Fig. 8).

Description. Fin rays formula: dorsal-fin rays Ⅲ, 7; anal-fin rays Ⅲ, 5; ventral-fin rays Ⅰ, 6; pectoral-fin rays Ⅰ, 8; branched caudal fin rays, 16; upper procurrent unbranched caudal ray, 6; lower procurrent unbranched caudal rays, 5. As the specimen deformation, morphometric data were not available.

Head, body and caudal peduncle laterally compressed. Dorsal is homogenous between nape and dorsal-fin base and it is slightly decreasing towards caudal-fin base. Head small, preorbital part of the

Figs 9 – 10. Lateral view of body shape and pigmentation patterns of *C. australis* sp. nov. 9. Male. 10. Female. Scale bars = 1 cm.

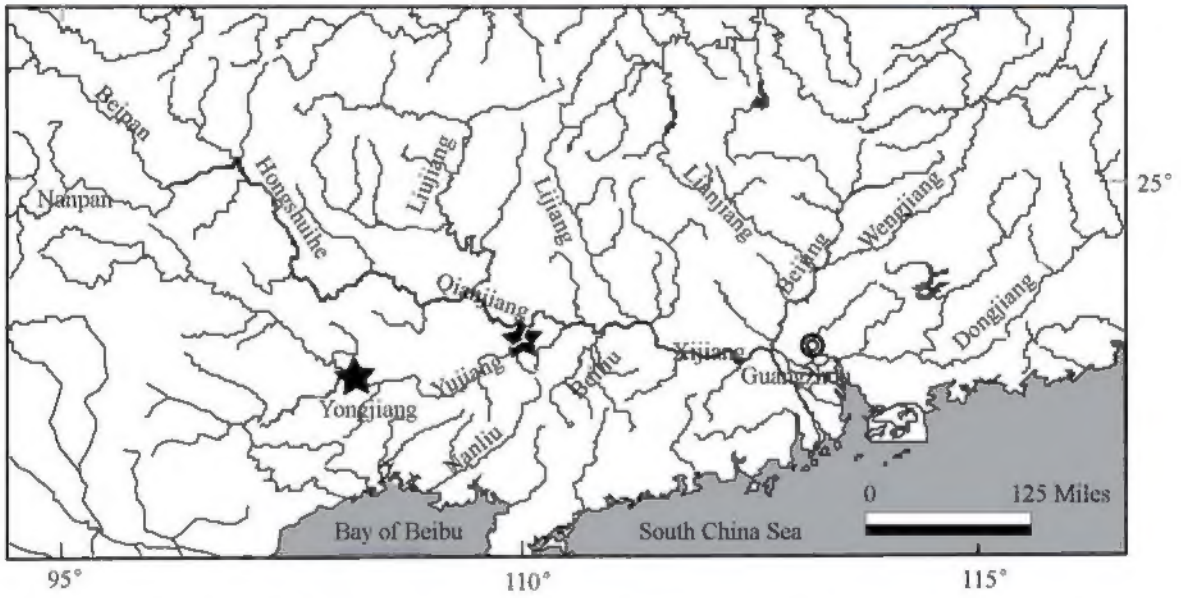


Fig. 11. Map showing the collection sites (i. e., currently known localities) of *Cobitis australis* sp. nov. ★ Type locality of *Cobitis australis* sp. nov.

head slightly longer than postorbital part. Eyes small, located on upper lateral surface of head closer to gill opening than to snout. Interorbital width equal to or slightly wider than eye diameter. Barbels short, anterior rostral barbels almost equal to or shorter than the eye-diameter, maxillary barbels to under the nostrils, maxillo-mandibular barbels extend caudally not to underneath the eyes. Upper lip furrowed, slightly broad, lower lip broad, divided into two undeveloped mental lobes; two lower lip pointed not ending in a filiform tip (Fig. 4). Anterior nasal tube near the posterior orifice, closer to eyes than to tips. Suborbital spine situated in front of eyes, which bifid, the *processus latero-caudalis* short, less than one-third of the *processus medio-caudalis*, extends posteriorly the front edge of eyes (Fig. 7). Head without scales, body scales large, vertical elongated, oval, with a large, being closer to the base focal area, and 37 – 38 radial grooves, with 29 – 33 supplementary radial grooves (Fig. 8). Lateral line short, not exceeding as far as end of pectoral fins.

Dorsal fin is slightly long, located in middle of the posterior orifice and the base caudal-fin; dorsal fin length shorter than head length. In males, pectoral fins long, the second pectoral-fin ray being the longest, far from the ventral fins origin. In females, pectoral fins short, the third ray longest. Ventral fins short, small, and approximately at the same level as the third branched dorsal-fin ray. Anal fin small, almost located on the half of the space between the ventral and caudal

fins; anal fin not reaching caudal fin base. Caudal fin long, distal margin of caudal fin slightly truncated. Anus near the anal fins.

Colour pattern. Absence of the Gambetta's pigmentation pattern, sexual dimorph colour pattern is observed. On dorsum 17 – 20 irregular or oval bands from the occiput to the base of the caudal-fin in males, postdoral-fin bands are rectangle, 13 oval blotches in females, bands far broader than their interspaces. 11 – 13 irregular vertical elongated "v" -shape blotches along midlateral lines, which might be reduced to 4 – 5 spots behind head in males and 1 – 2 in females. "V" -shape blotches narrower than or equal to their interspaces. Between the dorsum and midlateral lines more than 20 vertical bars irregular speckles on dorsolateral in males and less than 20 in females, bars decreasing towards caudal-fin base. 4 – 5 rows of brownish dots on the dorsal and caudal fins. Few dark spots in paired fins. One conspicuous oval jet black spot on upper half of caudal fin base; many black dots and speckles sprinkled on the head, a black stripe from the occiput through eye to the insertion of the rostral barbel.

Sexual dimorphism. Males are smaller than females. Pectoral, dorsal, ventral and caudal fins of the males are longer than in the females. In males, the second pectoral ray is thickener and longer, with a slender and long finger-shaped *lamina circularis* at the base, which length 3.0 in length of the second pectoral-fin ray (Figs 5 – 6).

Etymology. The species name *australis* stems from the Latin *australis* meaning southern, in reference to the species occurs in South China.

Distribution. This new species occurs in the Yujiang and Yongjiang, the tributaries of the Pearl River, South China (Fig. 11).

4 Discussion

Cobitis australis sp. nov. is similar to the species of *Iksookimia* Nalbant, 1993, which was established by Nalbant (1993) based on five species of Korean *Cobitis*. *Iksookimia* is distinguished from *Cobitis* by the characteristics of an elongate second pectoral fin ray and the absence of the Gambetta's pigmentation pattern (Nalbant, 1993). However, the presence or absence of the character states of the Gambetta's pigmentation pattern and elongated or not of the second pectoral fin ray are not always congruent with the current outline of genera as most character states are observed in more than one genus (Šlechtová *et al.*, 2008). *Cobitis multimaculata* and *C. arenae* share with *Iksookimia* in both the characters of no Gambetta's pigmentation pattern and the second pectoral fin ray elongate (Chen and Chen, 2005, 2011). *Cobitis puncticulata* Erk'akan, Atalay-Ekmekci *et* Nalbant, 1998 and *C. turcica* Vasil'eva, Vasil'ev, Janko, Ráb et Rábobá, 2005 also are absent the Gambetta's pigmentation pattern. *Cobitis dolichorhynchu* Nichols, 1918 and *C. sinensis* Sauvage *et* Dabry, 1874 also have an elongate second pectoral fin ray (Chen and Chen, 2005: Fig. 6 F – G), which similar to that of the characters of *Iksookimia* (Nalbant, 1993: Figs 1 and 3; Kim and Park, 1997: Fig. 3). Several authors (Šlechtová *et al.*, 2008) suggested that diagnostic characters for nominal genus *Iksookimia* have little phylogenetic significance and the status and delimitation of the taxon needs to be carefully re-evaluated. Thus, we placed it in the genus *Cobitis*.

Cobitis australis is compared with five *Iksookimia* species, namely *I. koreensis* (Kim, 1975), *I. pumila* (Kim *et* Lee, 1987), *I. yongdokensis* Kim *et* Park, 1997, *I. hugowolfeldi* Nalbant, 1993 and *I. longicorpus* (Kim, Choi *et* Nalbant, 1976) (Table 3). *Cobitis australis* is similar to *I. koreensis* and *I. pumila* in having a slender and long finger-shaped *lamina circularis*. *Cobitis australis* can be distinguished from *I. koreensis* by 17 – 20 irregular narrow, more, short or oval bands on the dorsum (vs. 11 – 13 broad, less rectangular bands); 11 – 13 wide and short vertical bars along the midlateral line (vs. 13 – 14 thin and long vertical bars); 4 – 5 narrow bars in the caudal fin (vs. 3 – 4 broad bars) (Nalbant, 1993: Fig. 3; Kim and Park, 1997: Fig. 6); scales vertical elongated, with a slight large focal area (vs. round or oval scales with a large focal area) (Nalbant, 1993: Fig. 10). From *I. pumila* is distinguished by its colour pattern of lateral vertical bars discontinuous along dorsal upper blotches, between them a wide band of cloudy speckles on dorsolateral sides (vs. vertical bars or oval blotches continuous, or almost, along dorsal blotches, between them less than 10 vertical bars on dorsolateral sides). From *I. yongdokensis* and *I. hugowolfeldi* and *I. longicorpus* is distinguished by having a finger-shaped *lamina circularis* (vs. plate).

In China, three species, *C. arenae*, *C. multimaculata* and *C. australis*, absent the Gambetta's pigmentation pattern. Although *C. arenae* was considered as *Acantopsis arenae* based on the specimens collected in Lo River basin in Vietnam by Kottelat (2001) and by Froese and Pauly (2013), *Acantopsis* has no the *lamina circularis*. (Siebert, 1991: Fig. 3), while *C. arenae* has a *lamina circularis* on the second pectoral fin ray (Chen and Chen, 2005, 2011). In this paper, *C. arenae* is considered as a valid species. *Cobitis australis* is easily distinguished from *C. arenae* and *C. multimaculata* by having a finger-shape *lamina circularis* (vs. plate); and its colour pattern, lateral vertical bars discontinuous along dorsal upper blotches, between them a wide band of cloudy speckles on dorsolateral sides (vs. small oval blotches or dots on the dorsolateral sides) (Table 3).

The spined loach, *Cobitis taenia* Linnaeus, 1758, is listed as an endangered species in many European countries (Kotusz, 1996). The populations of *C. arenae* and *C. multimaculata* are declining; no specimens of *C. arenae*, *C. multimaculata* and *C. australis* were collected in recent sampling collection trips. However, the specimens of *C. microcephala*, which are known to co-occur in the Nanliu River with *C. multimaculata*, can be collected. The reasons for theirs decline are uncertain, but the biodiversity in this area should be received attention, and the natural habitats need to be protected.

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中国广西壮族自治区珠江流域鳅属一新种

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摘 要 记述采自中国广西壮族自治区邕江和郁江鳅属 *Cobitis* 1 新种，南方鳅 *Cobitis australis* sp. nov.。通过扩增其线粒体细胞色素 *b* 基因，与已知鳅属和益秀朝鲜鳅属 *Iksookimia* 物种进行遗传距离比较，并构建系统发育树，结合形态分析，确认其为 1 新种。南方鳅与本属其它种类的区别主要为：鳴氏斑纹分界不明显（Gambetta's pigmentation pattern），斑纹具两性异形。雄性背部斑纹不规则，约 17～20 个，背鳍后斑纹融合为马鞍形；雌性背部斑纹约 13 个，背鳍前斑纹在体侧延伸为三角形。体侧中线 11～13 个不规则的“V”形或倒三角形斑纹，雄性头后 4～5 个小斑纹，雌性 1～2 个小斑纹。背部和体侧中线之间为形状和大小不规则的斑纹，雄性多于 20 个，该处斑纹与背部和体侧中线斑纹有融合；雌性少于 20 个，无融合。背鳍和尾鳍各具有 4～5 列点状条纹；雄性胸鳍第 1 根分枝鳍条基部的骨质突起（lamina circularis）指状，第 1 根分支鳍条延长，胸鳍似旗状；体鳞较大，延长，卵圆形，鳞焦略大，基位；颏叶不发达，末端钝圆；须短，其长等于或略小于眼径。新种体色斑纹与益秀朝鲜鳅属种类相似，新种与益秀朝鲜鳅 *Iksookimia koreensis*（Kim, 1975）和斑纹益秀朝鲜鳅 *Iksookimia pumila*（Kim *et* Lee, 1987）的主要区别是，前者背鳍和尾鳍各具 4～5 条斑纹，背部斑纹和体侧中线斑纹不相连，体侧中线 11～13 个宽而短的倒三角形斑纹；益秀朝鲜鳅背鳍和尾鳍各具有 3～4 列条纹，体侧中线下 13～14 个窄而长的倒三角形斑纹；斑纹益秀朝鲜鳅背鳍和尾鳍各具有 2～3 列条纹，背部斑纹和体侧中线斑纹相连，两列斑纹之间斑块少于 10 个，体侧中线 9～10 个宽而长的条状或倒三角形斑纹。新种与盈德益秀朝鲜鳅 *Iksookimia yongdokensis* Kim *et* Park, 1997、休氏益秀朝鲜鳅 *Iksookimia hugowolfeldi* Nalbant, 1993 和长身益秀朝鲜鳅 *Iksookimia longicorpus*（Kim, Choi and Nalbant, 1976）的主要区别是，前者骨质突起指状，后者骨质突起圆盘状。

关键词 鲤形目，鳅科，鳅属，新种，广西.

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